

STAT 157 – Test 2: Version A

November 29, 2017

Name: _____

Instructor: Patricia Wrean

Total: 30 points

1. (6 points) A computer system requires a case-sensitive, alphanumeric password containing 8 characters. How many passwords are there

(a) in total?

(b) that start with a lower case letter?

(c) that start with a lower case letter and end in a number?

2. (9 points) Two hundred families in Greater Victoria were surveyed to find out what kind of pet they own. The most common pets were dogs and cats, and the associated results are shown below.

	dog	no dog
cat	24	70
no cat	40	66

In your answers below, show enough work that I can see which method you are using.

- (a) What's the probability that a family chosen at random owns a dog?
- (b) What's the probability that a family chosen at random owns both a dog and a cat?
- (c) What's the probability that if a family chosen at random owns a dog, that they also own a cat?
- (d) Are the events "owning a dog" and "owning a cat" independent? Explain briefly, being sure to state the values of the probabilities you are comparing.

3. (8 points) The Saanich city council has four members: Alex, Barbara, Charlie, and Dorothy. Two of these members are to be selected to form a subcommittee to study the city's traffic problems. Assume that there is an equal chance of selecting each council member, that the order of selection doesn't matter, and you cannot select a single person twice in a row.
- (a) How many different subcommittees are possible? Explain briefly.
- (b) What is the probability that Dorothy is a member of the committee?
- (c) What is the probability that Charlie and Dorothy are both selected?
- (d) What is the probability either Charlie or Dorothy or both are selected? Show enough work that I can tell what method you are using.
- (e) Calculate your answer to part (d) again, but use a different method and show your work!

4. (7 points) The response time for a fire department is the time from when a 911 call was made until the time at which the firefighters show up at the scene of the fire. In Calgary, the average response time is 7.1 minutes, with a standard deviation of 1.6 minutes. Assume that the response time is normally distributed.
- (a) What is the probability that the response time for a randomly chosen call is between 5 and 10 minutes?
- (b) 85% of calls have a response time that is larger than a certain value. Find that value.